A two-hour hunt for *Helix carolinensis*, made December 1, upon the timbered flats of the Paint Rock River, resulted as follows: *Helix obstricta* Say, var. 4. Binn = *H. carolinensis* Lea, 59. *H. inflecta* Say, 22. *H. thyroides* Say, 13. *H. stenotrema* Fér., 3. *Zonites laevigatus* Pfr., 1, *Z. acerrus* Lewis 2. *Patula alternata* Say., var. *mordax* Shutt, 4. *Selenites concava* Say, 1 *Limacidae*, 8. A little later in the season, these flats will be inundated most of the time for several months. A visit to the same station a little earlier than this last year, yielded about the same results.

NOTES ON SOME NEW ZEALAND LAND AND FRESH WATER MOLLUSKS.

BY HENRY SUTER.

1. *Ancylus woodsi* Johnston. About one year ago, I discovered a small Ancylus in the River Avon, near Christchurch, which I recognized as being identical with *A. woodsi* from Tasmania. This was, to my knowledge, the first Ancylus ever found in New Zealand, and I mentioned the fact in Crosse's Journ. de Conch., vol. 32, p. 248. I can not recognize *Ancylus dohrnianus* Clessin as a New Zealand species, as long as Clessin can not give the exact locality where his species has been found, and thus enable us to verify its occurrence in this colony. There is no such Ancylus known to New Zealand conchologists, and it therefore will only help to swell the already large list of shells erroneously ascribed to New Zealand.

Only a few weeks ago, I collected a good number of *A. woodsi*, and this time alive. To my great astonishment I found several specimens with a septum more or less in process of formation, so that there could be no doubt but that this mollusk is not an Ancylus at all, but a *Gundlachia*. This was further confirmed by examining the radula, which perfectly corresponds with the radula of a Gundlachia collected and kindly sent to me by my friend, Dr. V. Sterki, of New Philadelphia, Ohio. Having come into possession of some literature on Tasmanian mollusks, I now find that Johnston, in his description of *A. woodsi* (Proc. Roy. Soc. Tasm., 1878, page 25) says: "Animal and teeth almost similar to *Gundlachia petterdi*." And in the description of *G. petterdi* (l. c. page 23) he writes: "In the young state the shell is simple, and resembles the common Ancylus." I really do not understand why Johnston established the n. sp. *A. woodsi*, when he must have been fully aware of the fact that it

was a young Gundlachia! In his list of Tasmanian mollusca, 1890, he simply drops his *A. woodsi* without mentioning that it is a young Gundlachia. I have not yet found full-grown specimens of our *Gundlachia*, but I hope to succeed later on, and it is to be expected to be a similar form to *G. petterdi* Johnston.

Prof. Hutton suggested to me that this *Gundlachia* might, perhaps, have been introduced from Tasmania on aquatic plants, which were used in packing trout ova, and as our fish-hatching ponds are in communication with the river Avon, there is all possibility of this being really the case. However, there is one objection. Up to the present day I found our *Gundlachia* only on aquatic plants in the lower parts of the river, from the outflow of Horseshoe Lake to New Brighton, but not upward between this outflow and the fish-hatching ponds. This makes it very likely that *Gundlachia* occurs in the swampy Horseshoe Lake, difficult of access, and was washed down in the river Avon when the canal was cleared from *Anacharis* weeds. If this mollusk is really indigenous, it will, no doubt, be found in localities where the introduction from Tasmania is out of question, but as long as this is not the case, we must remain doubtful on this point.

In the "Reference List" I published with my friend Mr. Ch. Hedley, of Sydney (Proc. Linn. Soc. N. S. W., vol. VII (2) p. 624), he put down *Ancylus tasmanicus* Tenison-Woods, as being synonymous with *A. woodsi*. This is wrong, as the former is quite different, and I believe it to be really an *Ancylus*. *A. australicus* Tate and *A. smithi* Cox are very likely also young forms of *Gundlachia*. *A. assimilis* Pett. and *A. oblonga* Pett. I have not seen. It would be of highest interest to examine the dentition of the Caledonian *A. reticulatus* Gassies and *A. noumeensis* Crosse, which Mr. Hedley thinks to be nearly allied to the so-called *A. woodsi*.

2. *Rhytida meesoni* Suter (Reference List, l. c. page 631) is no *Rhytida*, but a *Paryphanta*, as the animal lays calcareous eggs, whilst the genus *Rhytida* is considered to be viviparous. The genera *Paryphanta* and *Rhytida* are in the shells, the exterior of the animals and the radula so nearly allied, that it is not always easy to separate them. Very likely the genital organs will show generic differences, and it is my intention to study the anatomy of these genera as soon as opportunity offers and time permits.

3. *Thalassohelix ziczac* Gould. There was always some doubt whether this shell was really a New Zealand species or not, and at

the request of Mr. Hedley, when we worked out our "Reference List," I tried to solve the question. I came to the conclusion that *Th. portia* Gray must be the same species, and therefore they appear as synonyms in our list. I then selected two perfectly similar specimens, and sent one to Mr. Edg. A. Smith of the Brit. Museum for comparing it with Gray's type of *H. portia*, the other to Dr. Dall, Washington, to compare it with Gould's type of *H. ziczac*. Both gentlemen very kindly acceded to my request, and I herewith wish to express my gratitude to them.

Mr. Edg. A. Smith writes: "*Helix portia* Gray. Right, but I doubt if Gould's *ziczac* is the same species." And Dr. Dall reports: "There is no doubt whatever of the identity of your shell with Gould's type. He, in his preliminary report (Otia Conch., p. 17), refers it to New South Wales, but in his final report (Moll. U. S. Expl. Exp., p. 41), he says that it was collected by Dr. Pickering in a crater at Taiamea, New Zealand. His type was a little faded, hence the prominence of the dark variable lines and the straw color of the shell." These reports set all doubts at rest.

4. *Thalassohelix zelandiæ* Gray. In a letter to me, Mr. H. A. Pilsbry expressed his opinion that the shell Prof. Hutton and I considered to be Gray's *Hel. zelandiæ* might, perhaps, be another species. I therefore forwarded a specimen to Mr. Edg. A. Smith, and he kindly compared it with Gray's types. His opinion is as follows: "The shell under this name is, I think, a form of that species. It is larger than any of our typical examples and more brightly variegated, and the whorls are perhaps, a trifle flatter, still I think it is only a variety." To this I would remark that most species of *Thalassohelix* are subject to great variation, and I am confident that we identify the right shell as *Th. zelandiæ* Gray.

5. *Endodonta varicosa* Pfeiffer, I considered to be synonymous with *E. timandra* Hutton (Reference List, l. c., p. 651). Mr. H. A. Pilsbry, however, denies their identity (Man. Conch. (2) VIII, p. 84), and I therefore also sent specimens of *E. timandra* to Mr. Edg. A. Smith for comparing them with *varicosa* Pfr. He kindly sent me the following information: "*E. timandra* Hutt. This is *distinct* from *varicosa* Pf. It is smaller, more openly umbilicated, has more riblets, and the armature of the mouth is different. There are three teeth in *timandra* and *one* (overlooked by Pfeiffer and Reeve) in *varicosa*, situated on the body-whorl. It is a very slender lamella, and might easily be overlooked." After receiving this report, I

looked all specimens of *E. timandra* in my collection carefully through, and had the great satisfaction to find a few specimens of *E. varicosa* Pf. The two species differ in the characters mentioned by Edg. A. Smith; however, I have one specimen of *E. varicosa* with two lamellae in the body-whorl. If not very carefully examined, the two species may very easily be confounded. It seems that *E. timandra* occurs only on the North Island, while *E. varicosa* seems to be limited to South Island.

6. *Charopa sylvia* Hutton. I thought this species to be identical with *Ch. tau* Pfeiffer (Ref. List., l. c., p. 657), but felt always more or less doubtful. I therefore sent specimens with the others to Mr. Edg. A. Smith, and he very kindly wrote to me: "*Ch. sylvia* Hutt. You question this being the same as *Hel. tau* Pfr. We have not yet the latter in the Museum, but Pfeiffer's description of the sculpture '*subdistantum costato-plicata*' scarcely applies to your specimens. They are undoubtedly identical with Pieiffer's *Hel. gamma*. I have compared them with the types, and they agree in every respect, excepting that yours are fresher." Therefore:

Charopa buccinella Reeve, sp., 1852 (=*gamma* Pfeiffer, 1852 (? 1853) = *sylvia* Hutton, 1883).

Now it remains to identify *Ch. tau* Pfr. It may be that my *Charopa mutabilis* is this species; I have sent a specimen to Vienna to have it compared with Pfeiffer's type, and am awaiting a report.

New Zealand, Christchurch, Sept. 6, 1893.

SHELLS OF THE SAGINAW VALLEY, MICHIGAN.

BY BRYANT WALKER, DETROIT, MICHIGAN.

Some twenty-five years ago the late Dr. George A. Lathrop, while residing at East Saginaw in this State, made a considerable collection of the shells, which he found in that vicinity.

After lying packed away for many years, the collection has recently come into my possession, and as it contains some material of considerable interest, and no local catalogue from that part of the State has ever been published, the following list of the species represented has been deemed worthy of a permanent record.

I am indebted to Dr. V. Sterki for the determination of the Pupidæ and to Mr. A. A. Hinkley for the identification of Goniobasis